



# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

|   |  |   |  |  |
|---|--|---|--|--|
| Applicant's or agent's file reference<br>1.239.001 WO   |  | <b>FOR FURTHER ACTION</b>   |  | See Form PCT/PEA416                          |
| International application No.<br>PCT/NL2005/000153  |  | International filing date (day/month/year)<br>01.03.2005  |  | Priority date (day/month/year)<br>03.03.2004 |
| International Patent Classification (IPC) or national classification and IPC<br>INV. A61F2/16   |  |   |  |  |
| Applicant<br>AKKOLENS INTERNATIONAL B.V. et al.   |  |   |  |  |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 2 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> |  |   |  |  |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>   |  |   |  |  |
| Date of submission of the demand<br><br>21.11.2005  |  | Date of completion of this report<br><br>09.06.2006   |  |  |
| Name and mailing address of the international preliminary examining authority:<br> European Patent Office<br>D-80298 Munich<br>Tel. +49 89 2399 - 0 Tx: 523656 epmu d<br>Fax: +49 89 2399 - 4465   |  | Authorized officer<br><br>Merté, B<br><br>Telephone No. +49 89 2399-2851<br> |  |  |

INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITYInternational application No.  
PCT/NL2005/000153**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
    - ☐ international search (under Rules 12.3(a) and 23.1(b))
    - ☐ publication of the international application (under Rule 12.4(a))
    - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-10 as originally filed

**Claims, Numbers**

1-12 filed with telefax on 31.05.2006

**Drawings, Sheets**

1/3-3/3 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

|                               |             |      |
|-------------------------------|-------------|------|
| Novelty (N)                   | Yes: Claims | 1-12 |
|                               | No: Claims  |      |
| Inventive step (IS)           | Yes: Claims | 1-12 |
|                               | No: Claims  |      |
| Industrial applicability (IA) | Yes: Claims | 1-12 |
|                               | No: Claims  |      |

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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**Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

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**Re Item V:**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

**V.1 Technical Field and Closest State of the Art:**

In the technical field of artificial intraocular lenses of variable optical power the closest prior art is considered to be represented by document

**D8=: US-A-4994082** (OPHTHALM. VENTURES LTD. PARTNERSHIP) 19 February 1991 (1991-02-19)

that discloses an artificial IOL according the preamble of **claim 1**, i.e. of variable optical power (**D8: col. 2, l. 26-30**) comprising at least two optical elements (**Figs. 5, 6, reference numerals 200, 202**) which can be shifted relative to each other in a direction extending perpendicular to the optical axis (**col, 7, l. 45-51**).

**V.2 Disadvantage and Problem to be Solved:**

The amount of possible accommodation of the assembly known from document **D8** being relatively limited, the application aims at providing a lens system of two lenses that are equally relatively movable in a plane perpendicular to the optical axis because of the limited space available in the eye, but capable of a higher degree of accommodation.

**V.3. Novelty of the independent claim [Article 33(2) PCT] - Solution to the Problem Posed:**

According to the only independent claim 1 the optical elements of the AIOL are each connected to an elastic and a non-elastic haptic, wherein the elastic haptic of one element is connected to the non-elastic haptic of the other element through a connecting anchor, the connecting anchor connecting the optical system directly to a part of the capsular bag or to a supporting component which in turn connects to a part of the capsular bag. This particular arrangement of elastic and non-elastic elements is capable of efficiently transferring the force exerted by the capsular bag such that contraction or relaxation, respectively, leads to different degrees of overlap of the optical elements, and thus to different diopter powers of the system.

**V.4 Inventive Activity [Article 33(3) PCT]:**

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None of the known prior art documents suggests to provide an elastic and a non-elastic haptic for each optical element of an IOL of the type known from document **D8**.

The dependent claims comprise further embodiments of the invention.

**V.5 Remarks:**

The amended **claim 1** is based on original **claim 1** in combination with **p. 5, l. 33 - p. 6, l. 4**, see also **Figs. 2A and 2B**.

**Re Item VII:**

**VII.1** All features of the claims should have been provided with reference signs placed in parentheses [**Rule 6.2(b) PCT**].

**VII.2** In order to meet the requirements of **Rule 5.1(a)(ii) PCT**, document **D8** should have been identified in the description, the relevant background art disclosed therein being briefly discussed.

**VII.3** The description should be brought in conformity with the claims to be filed as required by **Rule 5.1(a)(iii) PCT**. In particular the embodiments shown in **Figs. 3-7** are not covered by the claims.

**Re Item I:**

**I.1** It would appear that there is a part of **claim 1** missing by mistake. The examination has been carried out as if the characterising portion of **Claim 1** read:

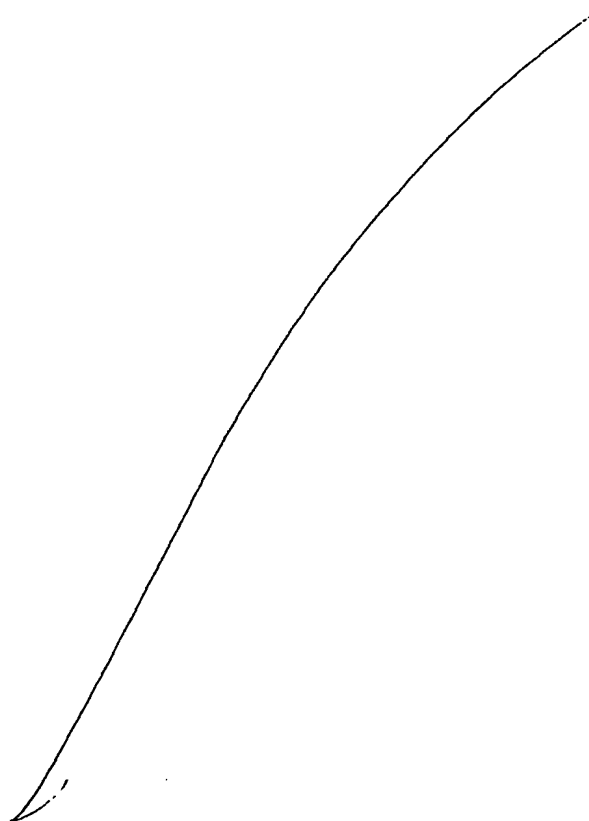
...characterised in that the optical elements of the AIOL are each connected to an elastic and a non-elastic haptic, in that the elastic haptic of one element is connected to the non-elastic haptic of the other element through a connecting anchor, and in that the connecting anchor connects the optical system directly to a part of the capsular bag or to a supporting component which in turn connects to a part of the capsular bag.

This is in line with **p. 6, l. 2-4** of the description. The connection to the capsular bag is considered to be essential to the reliable performance of the invention.

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(SEPARATE SHEET)**

International application No.

PCT/NL2005/000153



31-05-2006

13:56 PATENTWERK BV → 000498923994465

NL0500153

Amended claims PCT/NL2005/000153  
As filed with letter dated May 31, 2006

1. Artificial intra ocular lens of variable optical power comprising at least two optical elements which can be shifted relative to each other in a direction extending perpendicular to the optical axis wherein the optical elements have such a shape that they exhibit, in combination, different optical powers at different relative positions,  
5 characterized in that the optical elements are each connected to an elastic haptic and an non-elastic haptic, and that the elastic haptic of one element is connected to the non-elastic haptic of the other element through a connecting anchor and that
2. Artificial intra ocular lens as claimed in claim 1, characterized in that the  
10 elastic haptics and the non-elastic haptics are connected to opposite sides of the optical elements.
3. Artificial intra ocular lens as claimed in claim 1 or 2, characterized in that the non elastic elements are formed by fixed elements.  
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4. Artificial intra ocular lens as claimed in any of the preceding claims, characterized in that at least one of its optical elements has at least one saddle shaped surface.
- 20 5. Artificial intra ocular lens as claimed in any of the preceding claims, characterized in that the connecting anchor is adapted to be connected to the a part of the capsular bag of the eye.
6. Artificial intra ocular lens as claimed in any of the preceding claims,  
25 characterized in by adjusting means which are connected to the optical elements for adjustment of the resting position of the optical elements.
7. Application of artificial intra ocular lens according to one of the preceding claims, characterized by application of the lens for correction of a disorder of the eye.  
30
8. Application of artificial intra ocular lens as claimed in any of the preceding claims, characterized by the use of the lens as an accommodating artificial intra ocular lens.

9. Application of artificial intra ocular lens as claimed in any of the claims 1-7, characterized by the use of the lens as a non-accommodating artificial intra ocular lens.
- 5 10. Artificial intra ocular lens as claimed in any of the preceding claims, characterized in that at least one of its two planes has an optical diffraction structure.
- 10 11. Artificial intra ocular lens according to any of the preceding claims, characterized in that at least one of the optical elements comprises an optical structure of the GRIN type.
12. Artificial intra ocular lens according to any of the preceding claims, characterized in that the optical elements are adapted to change their combined optical power when rotated relatively to each other.

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